

Fossil Energy Research and Development Office of Fossil Energy

Overview

Appropriation Summary by Program

(dollars in thousands)

| FY 2004 Comparable Appropriation | FY 2005 Comparable Appropriation | FY 2006 Base | FY 2006 Request | FY 2006 Request vs Base | |
|--|--|-----------------|--------------------|-------------------------|----------|
| | | | | \$ Change | % Change |

Fossil Energy Research and Development

| | | | | | | |
|--|----------------|----------------|----------------|----------------|----------------|---------------|
| Coal and Other Power Systems | 439,057 | 351,130 | 351,130 | 351,000 | -130 | -0.0% |
| Natural Gas Technologies | 41,836 | 44,839 | 44,839 | 10,000 | -34,839 | -77.7% |
| Petroleum - Oil Technology | 34,107 | 33,921 | 33,921 | 10,000 | -23,921 | -70.5% |
| Program Direction and Management Support | 106,225 | 104,528 | 106,068 | 98,941 | -7,127 | -6.7% |
| Plant and Capital Equipment | 6,914 | 6,902 | 6,902 | 0 | -6,902 | -100.0% |
| Fossil Energy Environmental Restoration | 9,595 | 9,467 | 9,467 | 8,060 | -1,407 | -14.9% |
| Import/Export Authorization | 2,716 | 1,774 | 1,774 | 1,799 | +25 | +1.4% |
| Advanced Metallurgical Processes | 9,876 | 9,861 | 9,861 | 8,000 | -1,861 | -18.9% |
| National Academy of Sciences Program Review | 494 | 493 | 493 | 0 | -493 | -100.0% |
| Special Recruitment Programs | 0 | 656 | 656 | 656 | 0 | +0.0% |
| Cooperative Research and Development | 8,161 | 8,283 | 8,283 | 3,000 | -5,283 | -63.8% |
| Total, Fossil Energy Research and Development ... | 658,981 | 571,854 | 573,394 | 491,456 | -81,938 | -14.3% |

Clean Coal Technology

| | | | | | | |
|---------------------------|---------|--------|--------|----------|----------|---------|
| Advance Appropriation.... | 87,000 | 97,000 | 97,000 | 257,000 | +160,000 | +164.9% |
| Rescission | -88,000 | 0 | 0 | -257,000 | -257,000 | -100.0% |

(dollars in thousands)

| | FY 2004 Comparable Appropriation | FY 2005 Comparable Appropriation | FY 2006 Base | FY 2006 Request | FY 2006 Request vs Base | |
|---|--|--|-----------------|--------------------|-------------------------|----------|
| | | | | | \$ Change | % Change |
| Deferral of Unobligated Balances | -97,000 | -257,000 | -257,000 | 0 | +257,000 | +100.0% |
| Total, Clean Coal Technology | -98,000 | -160,000 | -160,000 | 0 | +160,000 | +100.0% |
| Strategic Petroleum Reserve | 170,948 | 169,710 | 170,048 | 166,000 | -4,048 | -2.4% |
| Northeast Home Heating Oil Reserve | 4,939 | 4,930 | 4,930 | 0 | -4,930 | -100.0% |
| Naval Petroleum Reserves | 17,995 | 17,750 | 17,895 | 18,500 | +615 | +3.4% |
| Elk Hills School Lands Funds | 36,000 | 36,000 | 36,000 | 84,000 | +48,000 | +133.3% |
| Total, Office of Fossil Energy | 790,863 | 640,244 | 642,267 | 759,956 | +117,689 | +18.3% |

Detailed Funding Table

(dollars in thousands)

| FY 2004 | FY 2005 | FY 2006 |
|---------|---------|---------|
|---------|---------|---------|

Fossil Energy Research and Development

Coal and Other Power Systems

President's Coal Research Initiative

Clean Coal Power Initiative

| | | | |
|-----------------------------------|---------|--------|--------|
| Clean Coal Power Initiative | 165,171 | 49,305 | 50,000 |
|-----------------------------------|---------|--------|--------|

| | | | |
|-----------------|-------|--------|--------|
| FutureGen | 8,640 | 17,750 | 18,000 |
|-----------------|-------|--------|--------|

| | | | |
|--|---------|--------|--------|
| Total, Clean Coal Power Initiative | 173,811 | 67,055 | 68,000 |
|--|---------|--------|--------|

Central Systems

| | | | |
|---------------------------------------|--------|--------|--------|
| Innovations for Existing Plants | 21,238 | 19,081 | 23,850 |
|---------------------------------------|--------|--------|--------|

| | | | |
|------------------------|--------|--------|--------|
| Advanced Systems | 66,502 | 66,415 | 74,450 |
|------------------------|--------|--------|--------|

| | | | |
|------------------------------|--------|--------|--------|
| Total, Central Systems | 87,740 | 85,496 | 98,300 |
|------------------------------|--------|--------|--------|

| | | | |
|---------------------|--------|--------|--------|
| Sequestration | 39,375 | 45,361 | 67,200 |
|---------------------|--------|--------|--------|

Fuels

| | | | |
|--|--------|--------|--------|
| Transportation Fuels and Chemicals | 21,340 | 23,470 | 22,000 |
|--|--------|--------|--------|

| | | | |
|----------------------------------|-------|-------|---|
| Solid Fuels and Feedstocks | 5,820 | 5,916 | 0 |
|----------------------------------|-------|-------|---|

| | | | |
|-------------------------------|-------|-------|---|
| Advanced Fuels Research | 3,216 | 2,761 | 0 |
|-------------------------------|-------|-------|---|

| | | | |
|--------------------|--------|--------|--------|
| Total, Fuels | 30,376 | 32,147 | 22,000 |
|--------------------|--------|--------|--------|

**Fossil Energy Research and Development/
Overview**

FY 2006 Congressional Budget

(dollars in thousands)

| | FY 2004 | FY 2005 | FY 2006 |
|---|---------|---------|---------|
| Advanced Research | | | |
| Coal Utilization Science..... | 11,581 | 17,552 | 8,000 |
| Materials..... | 10,809 | 10,848 | 8,000 |
| Technology Crosscut..... | 11,326 | 10,355 | 10,500 |
| University Coal Research..... | 2,863 | 2,958 | 3,000 |
| HBCUs, Education & Training | 954 | 986 | 1,000 |
| Total, Advanced Research..... | 37,533 | 42,699 | 30,500 |
| Total, President's Coal Research Initiative | 368,835 | 272,758 | 286,000 |
| Other Power Systems | | | |
| Distributed Generation Systems | | | |
| Fuel Cells | 66,833 | 74,428 | 65,000 |
| Novel Generation | 2,401 | 2,958 | 0 |
| Total, Distributed Generation Systems..... | 69,234 | 77,386 | 65,000 |
| U.S./China Energy and Environmental Center | 988 | 986 | 0 |
| Total, Other Power Systems..... | 70,222 | 78,372 | 65,000 |
| Total, Coal and Other Power Systems..... | 439,057 | 351,130 | 351,000 |
| Natural Gas Technologies | | | |
| Exploration and Production..... | 21,590 | 23,666 | 10,000 |
| Gas Hydrates | 9,150 | 9,368 | 0 |
| Infrastructure | 8,695 | 8,354 | 0 |
| Effective Environmental Protection | 2,401 | 3,451 | 0 |
| Total, Natural Gas Technologies..... | 41,836 | 44,839 | 10,000 |
| Petroleum – Oil Technology | | | |
| Exploration and Production..... | 17,939 | 18,736 | 10,000 |
| Reservoir Life Extension/Management..... | 6,723 | 5,916 | 0 |
| Effective Environmental Protection | 9,445 | 9,269 | 0 |
| Total, Petroleum – Oil Technology | 34,107 | 33,921 | 10,000 |
| Program Direction | | | |
| Fossil Energy Research and Development..... | 91,410 | 90,722 | 84,949 |
| Clean Coal Technology..... | 14,815 | 13,806 | 13,992 |
| Total, Program Direction..... | 106,225 | 104,528 | 98,941 |
| Plant and Capital Equipment | 6,914 | 6,902 | 0 |
| Fossil Energy Environmental Restoration..... | 9,595 | 9,467 | 8,060 |

**Fossil Energy Research and Development/
Overview**

FY 2006 Congressional Budget

(dollars in thousands)

| | FY 2004 | FY 2005 | FY 2006 |
|--|---------|---------|---------|
| Import/Export Authorization | 2,716 | 1,774 | 1,799 |
| Advanced Metallurgical Research..... | 9,876 | 9,861 | 8,000 |
| National Academy of Sciences Program Review | 494 | 493 | 0 |
| Special Recruitment Programs | 0 | 656 | 656 |
| Cooperative Research and Development..... | 8,161 | 8,283 | 3,000 |
| Total, Fossil Energy Research and Development..... | 658,981 | 571,854 | 491,456 |
| Strategic Petroleum Reserve..... | 170,948 | 169,710 | 166,000 |
| Northeast Home Heating Oil Reserve | 4,939 | 4,930 | 0 |
| Naval Petroleum Reserves..... | 17,995 | 17,750 | 18,500 |
| Elk Hills School Lands Funds | 36,000 | 36,000 | 84,000 |
| Total, Office of Fossil Energy | 790,863 | 640,244 | 759,956 |

Preface

Secure, affordable, and environmentally acceptable energy sources are essential if the people of our Nation and future generations are to maintain a high quality of life. In support of this, the Fossil Energy (FE) Research and Development Program addresses issues related to the use of fossil fuels.

In addition to the traditional uses of Fossil Fuels, the Fossil Energy Research and Development Program is a participant in the Administration's Hydrogen Fuel Initiative. The program is proceeding through the coordinated activities of the Department's major R&D Offices.

Within the Interior and Related Agencies appropriation, Fossil Energy Research and Development has eleven programs: Coal and Other Power Systems, Natural Gas Technologies, Oil Technology, Program Direction, Plant and Capital Equipment, Environmental Restoration, Import/Export Authorization, Advanced Metallurgical Research, Special Recruitment Programs, Cooperative Research and Development, and the Special Recruitment Program. Other programs which make up the Office of Fossil include the Clean Coal Technology Program, the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, the Naval Petroleum and Oil Shale Reserves, and the Elk Hills School Lands Funds. Natural Gas Technologies and Oil Technology are being terminated in FY 2006 and are discussed elsewhere in this budget document.

This Overview will describe Strategic Context, Mission, Benefits, Strategic Goals, and Funding by General Goal. These items together put the appropriation in perspective. The Annual Performance Results and Targets, Means and Strategies, and Validation and Verification sections address how the goals will be achieved and how performance will be measured. Finally, this Overview will address R&D Investment Criteria, Program Assessment Rating Tool (PART), and Significant Program Shifts.

Strategic Context

Following publication of the Administration's National Energy Policy, the Department developed a Strategic Plan that defines its mission, four strategic goals for accomplishing that mission, and seven general goals to support the strategic goals. Each appropriation has developed quantifiable goals to support the general goals. Thus, the "goal cascade" is the following:

Department Mission → Strategic Goal (25 yrs) → General Goal (10-15 yrs) → Program Goal (GPRA Unit) (10-15 yrs)

To provide a concrete link between budget, performance, and reporting, the Department developed a "GPRA^a Unit" concept. Within DOE, a GPRA Unit defines a major activity or group of activities that support the core mission and aligns resources with specific goals. Each GPRA Unit has completed or will complete a Program Assessment Rating Tool (PART). A unique program goal was developed for each GPRA Unit. A numbering scheme has been established for tracking performance and reporting.^b

The goal cascade accomplishes two things. First, it ties major activities for each program to successive goals and, ultimately, to DOE's mission. This helps ensure the Department focuses its resources on fulfilling its mission. Second, the cascade allows DOE to track progress against quantifiable goals and to tie resources to each goal at any level in the cascade. Thus, the cascade facilitates the integration of budget and performance information in support of the GPRA and the President's Management Agenda (PMA).

Another important component of our strategic planning – the President's Management Agenda – includes use of the Administration's R&D investment criteria to plan and assess programs and projects. The criteria were developed in 2001 and further refined with input from agencies, Congressional staff, the National Academy of Sciences, and numerous private sector and nonprofit stakeholders.

The chief elements of the R&D investment criteria are quality, relevance, and performance. Programs must demonstrate fulfillment of these elements. For example, to demonstrate relevance, programs are expected to have complete plans with clear goals and priorities. To demonstrate quality, programs are expected to commission periodic independent expert reviews. There are several other requirements, many of which R&D programs have and continue to undertake.

An additional set of criteria were established for R&D programs developing technologies that address industry issues. Some key elements of the criteria include: the ability of the programs to identify the appropriateness and need for Federal assistance; relevance to the industry and the marketplace; identification of transition points to industry commercialization (or of an off-ramp if progress does not meet expectations), and; the potential public benefits, compared to alternative investments, that accrue if the technology is successfully deployed.

The OMB-OSTP guidance memo to agencies dated June 5, 2003, describes the R&D investment criteria fully and identified steps agencies should take to fulfill them. (The memo is available on line at www.ostp.gov/html/fy05developingpriority.pdf.) Where appropriate throughout these justification

^a Government Performance and Results Act of 1993

^b The number scheme uses the following numbering convention: First 2 digits identify the General Goal (01 through 07); second two digits identify the GPRA Unit; last four digits are reserved for future use.

materials, especially in Significant Program Shifts and Explanation of Funding Changes subheadings, specific R&D investment criteria and requirements are cited to explain the Department's allocations of resources.

Mission

The mission of the Fossil Energy (FE) R&D Program is to create public benefits by enhancing U.S. economic, environmental, and energy security. The program carries out three types of activities: (1) managing and performing energy-related research that reduces market barriers to the reliable, efficient and environmentally sound use of fossil fuels for power generation and conversion to other fuels such as hydrogen; (2) partnering with industry and others to advance clean and efficient fossil energy technologies toward commercialization in the U.S. and international markets; and (3) supporting the development of information and policy options that benefit the public by ensuring access to adequate supplies of affordable and clean energy.

Benefits

The extent to which future public benefits are realized from FE R&D activities are a complex function of factors including: success meeting R&D goals; competition from other advanced technologies; future energy prices; and the future regulatory environment. Since the future of markets and regulations are uncertain, alternative, credible scenarios need to be considered. A summary of the methodologies, sensitivities, and assumptions used to develop benefits estimates are important, and must be considered before drawing conclusions based on benefits estimates.

FE, in coordination with other Department R&D programs has developed benefit estimates for its applied R&D programs. The Department is working to improve consistency across programs in the methodology and assumptions used in estimating program costs and benefits. The assumptions and methods underlying the modeling efforts have significant impact on the estimated benefits. Results could vary significantly if external factors, such as future energy prices, differ from the baseline case assumed for this analysis. Using the EIA's National Energy Modeling System (NEMS), with assumptions based on EIA's Annual Energy Outlook 2004 Reference Case, FE's preliminary estimates show economic benefits of the FE R&D portfolio range from \$164 to \$242 billion dollars, cumulative to 2025 in year 2002 dollars, non-discounted. These estimates are appropriate for providing relative "order of magnitude" estimates, while the Department continues to refine and standardize its methodology. This benefit is the sum of both the savings in cost of electricity due to lower cost generation options, as well as reduced natural gas prices to consumers. Reduced natural gas prices are based on the deployment of improved coal and gas-fueled generation options that have the effect of lowering the demand for and price of natural gas. The ranges are based on outputs from different scenarios, including one with higher oil and gas prices, and another with a moderate carbon emission constraint. Benefits from advanced technology deployment beyond 2025 are not considered, since NEMS is currently limited to a 2025 time frame. Other types of benefits may also occur, such as reduced mercury emissions, and derivative technology and products. In addition, there may be economic benefits, particularly from longer-term activities such as those from the hydrogen program, and portions of the sequestration program which are not currently modeled in NEMS and are therefore not included in these reported benefits.

FE is continuing to work on important methodological challenges affecting benefits estimates. One of the most important challenges concerns finding a generally acceptable approach for reflecting the

impacts of technology risk. This is critical since high-risk R&D is characteristic of much of the Government-supported energy portfolio. Risk is one of the areas that the National Research Council is expected to focus on as part of its ongoing study of the prospective benefits of Government-supported energy R&D.

Strategic, General and Program Goals

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission) plus seven general goals that tie to the strategic goals. The Fossil Energy Research and Development appropriation supports the following goals:

Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

The programs funded by the Fossil Energy R&D appropriation have the following three Program Goals which contribute to the General Goals in the "goal cascade":

Program Goal 04.55.00.00: Zero Emissions Coal-Based Electricity and Hydrogen Production: Create public/private partnerships to provide technology to ensure continued electricity generation and hydrogen production from the extensive U.S. fossil fuel resource, including control technologies to permit reasonable-cost compliance with emerging regulations, and ultimately, by 2015, zero emission plants (including carbon) that are fuel-flexible, and capable of multi-product output and energy efficiencies over 60 percent with coal and 75 percent with natural gas.

Program Goals 04.56.00.00 and 04.57.00.00 cover oil and gas activities, and will not be achieved with the termination of these program in FY 2006.

Contribution to General Goal

FE contributes to General Goal 4 through its Coal and Other Power Systems Program (\$351.0 million FY 2006 Request/\$351.1 million FY 2005) pursues Goal 04.55 above and encompasses the following activities:

- The Clean Coal Power Initiative (\$50 million FY 2006 Request; \$49.3 million FY 2005 – this does not include FutureGen funding) by 2010 will initiate demonstration of advanced coal-based power generation technologies capable of achieving: 45 percent electrical efficiency; greater than 90 percent Hg removal at a cost of 70 percent of current technology; and 0.15 lb/MMBtu NO_x at 75 percent of the cost of current technology (selective catalytic reactors). These technologies can be configured to co-produce heat, fuels, chemicals or other useful byproducts, and provide a deployment-ready suite of advanced technologies that can produce substantial near-, mid-, and long-range economic and environmental public benefits.

- The FutureGen research prototype facility (\$18 million FY 2006 Request; \$17.8 million FY 2005) within the Clean Coal Power Initiative subprogram, will demonstrate the technical feasibility and economic viability of the zero emission (including carbon) coal concepts.
- Innovations for Existing Plants (\$23.9 million FY 2006 Request; \$19.1 million FY 2005), within the Central Systems subprogram, supports the President's Clear Skies Initiative by having technologies ready for commercial demonstration by 2007 with the potential to reduce, from all coals: mercury by 50-70 percent at 70 percent of the 2003 reference cost of \$50,000-\$70,000/lb of mercury; NO_x to less than 0.15 lb/MMBtu at three-quarters of the cost of selective catalytic reactors (SCR), which is currently \$80-\$100/Kw; PM_{2.5} by 99.99 percent for less than \$50-\$70/kW; and acid gases by 95 percent. By 2010, test technologies for advanced cooling, mercury reduction by 90 percent at 70 percent of the 2003 reference cost of \$50,000-\$70,000/lb. of mercury; and a 66 percent increase in byproducts utilization.
- Advanced Power Systems (\$74.5 million FY 2006 Request; \$66.4 million FY 2005), within the Central Systems subprogram will, by 2010, complete R&D for advanced gasification combined cycle technology that can produce electricity from coal at 45-50 percent efficiency (HHV) at a capital cost of \$1,000 per kilowatt or less. By 2012, R&D will be completed to integrate this technology with CO₂ sequestration, capture and sequestration into a zero-emissions configuration(s) that can provide electricity with less than a 10 percent increase in cost.
- The Sequestration R&D activity (\$67.2 million FY 2006 Request; \$45.4 million FY 2005), by 2007, will demonstrate, at a pilot plant scale, technologies that result in less than 20 percent increase in the cost of electricity. By 2012, develop technologies to separate, capture, transport, and sequester carbon using either direct or indirect systems that result in less than 10 percent increase in the cost of electricity.
- The Fuels activity (\$22.0 million FY 2006 Request; \$32.1 million FY 2005), by 2010, will complete development of modules capable of co-producing hydrogen from coal at \$30/barrel crude oil equivalent (no incentives or tax credits) when integrated with advanced coal power systems.
- Advanced Research (\$30.5 million FY 2006 Request; \$42.7 million FY 2005) sustains U.S. preeminence in fossil fuel technology by supporting development of materials, computational methods, and control system knowledge needed to bridge gaps between science and advanced engineering. Advanced Research efforts will allow development, by 2010, of enabling technologies that support the goals of zero-emissions energy systems.
- Distributed Generation Systems (\$65.0 million FY2006 Request; \$77.4 million FY 2005), by 2010, will increase the robustness of distributed generation and thereby lower vulnerability of the electricity grid by introducing prototypes of 3-10 kilowatt solid oxide fuel cell modules with a 10-fold cost reduction to \$400 per kilowatt (versus a 2003 baseline of \$4500 per kilowatt), with 40-60 percent electrical efficiency and adaptable to zero-emission coal systems.

The Natural Gas Technologies and Oil Technology Programs (\$20.0 million FY 2006 Request; \$78.8 million FY 2005) are being terminated in FY 2006. The \$20 million in new budget authority requested in FY 2006 will be used for legal obligations incurred by the termination process. Prior year funds will be used to conduct ongoing projects.

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Funding by General and Program Goal

(dollars in thousands)

| | FY 2004 | FY 2005 | FY 2006 |
|---|---------|---------|---------|
| Goal 4, Energy Security | | | |
| Program Goal 04.55.00.00, Zero Emissions Coal-Based Electricity and Hydrogen Production | 439,057 | 351,130 | 351,000 |
| Program Goal 04.56.00.00, Natural Gas Technologies, Abundant Affordable Gas | 41,836 | 44,839 | 10,000 |
| Program Goal 04.57.00.00, Petroleum - Oil Technology, Abundant Oil | 34,107 | 33,921 | 10,000 |
| Total Goal 4, Energy Security | 515,000 | 429,890 | 371,000 |
| All Other | | | |
| Program Direction and Management Support..... | 106,225 | 104,528 | 98,941 |
| Plant and Capital Equipment..... | 6,914 | 6,902 | 0 |
| Fossil Energy Environmental Restoration..... | 9,595 | 9,467 | 8,060 |
| Import/Export Authorization | 2,716 | 1,774 | 1,799 |
| Advanced Metallurgical Processes..... | 9,876 | 9,861 | 8,000 |
| National Academy of Sciences Program Review | 494 | 493 | 0 |
| Special Recruitment Programs | 0 | 656 | 656 |
| Cooperative Research and Development..... | 8,161 | 8,283 | 3,000 |
| Total, All Other | 143,981 | 141,964 | 120,456 |
| Total, General Goal 4 (Fossil Energy Research and Development) | 658,981 | 571,854 | 491,456 |

Program Assessment Rating Tool (PART)

The Department implemented a tool to evaluate selected programs. PART was developed by the Office of Management and Budget (OMB) to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews.

The current focus is to establish outcome and output-oriented goals, the successful completion of which will lead to benefits to the public, such as increased national security and energy security, and improved environmental conditions. DOE has incorporated feedback from OMB into the FY 2006 Budget Request, and the Department will take the necessary steps to continue to improve performance.

Based in part on their "Ineffective" rating of the PART for the FY 2005 budget, the Oil and Natural Gas Technology programs will be terminated in FY 2006. In the PART for the FY 2005 budget, the Fuel Cell program and the Coal Research Initiative were rated as "Adequate".

The PART recommended that the program participate in the development of a consistent framework for the Department to analyze the costs and benefits of its R&D investments, and to apply this guidance as part of FY 2006 Budget Development. FE has made a major commitment to improve the quality of its

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Overview**

FY 2006 Congressional Budget

benefits estimates. This commitment includes adapting EIA's National Energy Modeling System (NEMS) to provide estimates of program benefits, incorporation of comments by national experts who reviewed the benefits methodology, working closely with DOE's Office of Energy Efficiency and Renewable Energy to develop common energy-related scenarios for NEMS and approaches for exploring technology risk, and working intensively with a National Research Council Committee as part of an ongoing study of methodologies to estimate the prospective benefits of DOE energy R&D. The Department prepared preliminary benefits estimates for its applied R&D programs, but still needs to improve consistency across programs in the methodology and assumptions used in estimating program costs and benefits.

Significant Program Shifts

Budget discipline necessitated close scrutiny of all Fossil Energy programs, using strict guidelines to determine their effectiveness and compare them to other programs offering more clearly demonstrated and substantial benefits. As a result, the 2006 Budget proposes to conduct orderly termination of the Oil and Gas programs in FY 2006.

Other significant budget increases will ensure that R&D supporting the FutureGen project is completed on schedule. FutureGen will employ advanced generation coal gasification technology integrated with combined cycle electricity generation, hydrogen production, and capture and sequestration of carbon dioxide (CO₂). The aim of FutureGen is to prove out the technical feasibility and potential economic viability of a zero emission coal energy system deployable by 2020. Supporting technologies with significant R&D funding increases include the Fuel Cell program, which is now entirely refocused on the \$400/kw SECA fuel cell and would allow plants evolving from FutureGen to reach their ultimate performance goals on schedule with reasonable risk; advanced mercury controls, where field testing will be required to demonstrate 90% recovery, and: carbon sequestration, where increased funding is needed for Phase II of the Regional Partnerships Program and pilot testing of capture technologies. All of these increases are justified through application of the R&D investment criteria (e.g. FutureGen is a Presidential Initiative as well as a key potential contributor to the President's Global Climate Change Initiative).

Congressional Items of Interest

(dollars in thousands)

| | FY 2004 | FY 2005 | FY 2006 | \$ Change | % Change |
|--|---------|---------|---------|-----------|----------|
| NETL Office/Lab Building | 3,951 | 3,944 | 0 | -3,944 | -100.0% |
| Total, Congressional Items of Interest | 3,951 | 3,944 | 0 | -3,944 | -100.0% |

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Overview**

FY 2006 Congressional Budget